MASONRY INSIGHTS

written in conjunction with International Masonry Institute

Case Study: Long Span Masonry Lintel

Contractor: Does the Long Span Masonry Lintel used for Underwood Elementary School look right?

Reviewer:

The 34 ft lintel is good. There were several ways to make it better.

- CJ at each end of the lintel:
  - prevents the lintel from engaging with wall and creating a fixed end condition
  - prevents arching action - this results in an isolated lintel carrying far more load
- The lintel was multi-course, but did not have top and bottom reinforcement (no fixed end), top and bottom reinforcement is smaller and the lintel performs better
- This lintel will have high stress concentrations at each end due to minimum bearing
- The f'm was good; however considering the span of lintel, a higher f'm could have been specified

Final Project

Check List

- [x] f'm (masonry assembly strength) is 2,000 psi or greater
  - [x] should be 2,500 psi, strengths between 2,000 to 4,000 psi are permitted in current codes[1]
- [ ] check that control joints (CJ)'s are located on plans
  - [ ] CJ's in reinforced structural walls
    - [ ] at common wall locations [2]: generally at 25 ft spacing or less, change of wall height, building corners
    - [ ] at a distance (recommend 2 ft) away from opening edges[3], not at opening edges
  - [ ] CJ's in unreinforced non-structural masonry walls
    - [ ] at common wall locations [2]
    - [ ] at openings edges [4]
  - [ ] CJ not needed when sufficient horizontal reinforcement [5] is provided
  - [x] **review lintels, and prefer masonry**
  - [x] **masonry lintels are considered first for ALL openings**
    - [ ] openings 8" or less do not need a lintel
    - [ ] openings 4'-0" or less could be a single-course masonry lintel with minimal reinforcement, and jamb could be one cell with common wall reinforcement
    - [x] openings more than 4'-0"
      - [x] consider masonry lintel as the first option
        - consider multi-course masonry lintels
        - consider stirrups in masonry lintels when deeper lintels are not possible

REFERENCES

[1] - current masonry code is TMS 602-16

[2] - based on NCMA TEK 10-2C (2010) or TEK 10-3

[3] - based on NCMA TEK 10-2C (2010), Figure 2c or Figure 2d (page 3)

[4] - based on NCMA TEK 10-2C (2010), Figure 2a or Figure 2b (page 3)